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UTILITY PATENT APPLICATION TRANSMITTAL
(Small Entity)

(Only for new nonprovisional applications under 37 CFR 1 53(b))

Docket No.
1923-48641

Total Pages in this Submission
21

TO THE ASSISTANT COMMISSIONER FOR PATENTS
Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1 53(b) is a new utility patent application for an invention entitled:

Entertainment and Stress Relief Disk

and invented by:

Daniel F. Lyman

If a CONTINUATION APPLICATION, *check appropriate box and supply the requisite information:*

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Which is a:

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Which is a:

☐ **Continuation** ☐ **Divisional** ☐ **Continuation-in-part (CIP)** of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below

2. ☒ Specification having 12 pages and including the following:

   a. ☐ Descriptive Title of the Invention

   b. ☐ Cross References to Related Applications *(if applicable)*

   c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*

   d. ☐ Reference to Microfiche Appendix *(if applicable)*

   e. ☒ Background of the Invention

   f. ☒ Brief Summary of the Invention

   g. ☒ Brief Description of the Drawings *(if drawings filed)*

   h. ☒ Detailed Description

   i. ☒ Claim(s) as Classified Below

   j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*

   a ☐ Formal b. ☒ Informal Number of Sheets one

4. ☒ Oath or Declaration

   a. ☒ Newly executed *(original or copy)* ☐ Unexecuted

   b. ☐ Copy from a prior application (37 CFR 1 63(d)) *(for continuation/divisional application only)*

   c. ☐ With Power of Attorney ☐ Without Power of Attorney

   d. ☐ *DELETION OF INVENTOR(S)*
   Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. 1.63(d)(2) and 1 33(b).

5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

6. ☐ Computer Program in Microfiche

7. ☐ Genetic Sequence Submission *(if applicable, all must be included)*

   a. ☐ Paper Copy

   b. ☐ Computer Readable Copy

   c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☐ Assignment Papers *(cover sheet & documents)*

9. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)*

10. ☐ English Translation Document *(if applicable)*

11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Acknowledgment postcard

14. ☒ Certificate of Mailing

    ☐ First Class ☒ Express Mail *(Specify Label No.):* TB338583344US

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10/13/99 jc544 U.S. PTO

Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

16. ☒ Small Entity Statement(s) - Specify Number of Statements Submitted: one

17. ☐ Additional Enclosures *(please identify below)*:

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	17	- 20 =	0	x	$9.00	$0 00
Indep. Claims	1	- 3 =	0	x	$39.00	$0.00
Multiple Dependent Claims (check if applicable) ☐						$0 00
					BASIC FEE	$380.00
OTHER FEE *(specify purpose)*						$0 00
					TOTAL FILING FEE	$380 00

☒ A check in the amount of **$380.00** to cover the filing fee is enclosed.

☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **04-1105** as described below. A duplicate copy of this sheet is enclosed.

- ☐ Charge the amount of as filing fee.
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- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

Dated:

Signature

George W. Neuner (Reg. No. 26,964)
Dike Bronstein Roberts & Cushman, LLP
130 Water Street
Boston, MA 02109
617/523-3400 (ext. 3038)

cc: **Customer No. 21874**

CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10) Applicant(s): Daniel F. Lyman			Docket No 1923-48641
Serial No. 09/_____	Filing Date Oct. 13, 1999	Examiner not assigned yet	Group Art Unit not assigned yet

Invention: **Entertainment and Stress Relief Disk**

I hereby certify that this **New Pat. Appln.; Small Entity Declaration; Check $380.00; transmittal letter**
(Identify type of correspondence)

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231-0001 on **Oct. 13, 1999**
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VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) AND 1.27 (b)) - INDEPENDENT INVENTOR	Docket No. 1923/48641

Serial No.	Filing Date	Patent No.	Issue Date
	Herewith		

Applicant/ Patentee: **Daniel F. Lyman**

Invention: **ENTERTAINMENT AND STRESS RELIEF DISK**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled above and described in:

- ☒ the specification to be filed herewith.
- ☐ the application identified above.
- ☐ the patent identified above.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ No such person, concern or organization exists.
- ☐ Each such person, concern or organization is listed below.

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR 1.27)

FULL NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

FULL NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR
SIGNATURE OF INVENTOR Daniel F. Lyman DATE: 10/11/99

NAME OF INVENTOR
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SIGNATURE OF INVENTOR DATE:

Docket No. 1923.48641

TITLE OF THE INVENTION: ENTERTAINMENT AND STRESS RELIEF DISK

INVENTOR: Daniel F. Lyman

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a passive diversion device for entertainment and stress relief. In particular, the device has two surfaces separated by a small distance and is configured to provide two equilibrium positions, one having a convex shape and the other having a concave shape when viewed from the same direction. The largest average dimension of the surfaces is substantially greater than the thickness of the device. By applying finger pressure to a surfaces of the device, the surfaces invert from one equilibrium position to the other.

2. Background Art

Hand held devices for exercise, amusement and stress relief are known in the industry. There are types of hand-held amusement devices that emit sounds. For example, U.S. Pat. No. 724,545 describes a snapping button with a springing snapping leaf. After pushing the leaf, it automatically springs back up to its original position and it emits a snapping sound. U.S. Pat. No. 949,551 describes a somewhat similar device with a convex surface that, after pushing in on the surface, automatically snaps back to its convex position due to the tension of the material. A hole in the device controls the sound emitted by the device. U.S. Pat. No. 1.206,933 describes a stiff plate with a reversible bulge, having a picture on its face, whereby reversal of the bulge causes the plate to emit a sound related to the picture. U.S. Pat. No. 1,026,256 describes a sounding disk made up of a diaphragm secured to a holder. Spaces are left between the holder and diaphragm such that movement of the diaphragm is not obstructed, and a high volume of sound is produced.

There are also hand-held exercise devices that provide stress relief such as U.S. Pat. No. 5,830,109. Such devices are typically digital or spherical in shape and are fabricated with flexible cores. These devices rest comfortably in a user's hand and the user squeezes and/or kneads the device.

Inexpensive amusement devices that also are capable of relieving stress are desirable and continuously sought.

SUMMARY OF THE INVENTION

The present invention provides a simple, inexpensive device that can be used for passive entertainment and stress relief through manual manipulation of the device. The device may be manufactured with varying degrees of stiffness, sizes, texture, color and scent so that individuals may chose a device based on personal preferences. The device may additionally be adapted to change color and/or produce sound upon manipulation.

In accord with the invention, an amusement and stress relief device comprises a flexible material formed into a disk-like shape having two opposite surfaces, a center portion and a peripheral portion, wherein the center portion has a convex/concave shape relative to the peripheral portion, and wherein the device is stable in tow positions, a first stable position where a first surface is concave and a second surface is convex and a second stable position where the first surface is convex and the second surface is concave. Preferably, the center portion protrudes out of a plane containing the peripheral portion. The disk-like device preferably has a circular peripheral edge, but can be formed with any shape peripheral edge.

Devices of the invention can be of any color, contain surface images or patterns, contain surface textures, contain scents, change colors, or contain various combinations of such features.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top view of a preferred embodiment of the invention in the form of a disk.

FIG. 2 is a side view of the device of FIG. 1 illustrating one equilibrium position and illustrating the second equilibrium position by dashed lines.

FIG. 3 is a cross sectional side view of the device of FIG. 1.

FIG. 4 is a cross sectional side view of a flexible, polymeric disk, which can be used to form the device illustrated in FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

With reference to the drawings, a preferred embodiment of the device in accord with the present invention will be described. The device **10** is shown in a preferred disk-like shape. However, the shape of the device may vary, for example, it may be square, octagonal, or triangular. Each device includes a peripheral lip portion **1** and a center portion **2** surrounded by the lip portion **1**. The device has an upper surface **3** and a lower surface **4,** one surface being concave and the other surface being convex. The concavity and convexity of the surfaces **3**, **4** are interchangeable. In other words, the device has two stable equilibrium positions, one being the concave upper surface **3** with convex lower surface **4** and the other being the convex upper surface **3** with concave lower surface **4**. Manual manipulation of the device inverts the surface from one equilibrium position to the other. The concave surface **3** or **4** preferably has a single peak **5** in the middle of the center portion **2**. The device, however, may have more than one peak **5**, provided that the two equilibrium positions as described are present in the device.

The cross-section of the device is substantially uniform in thickness. However, in a preferred device as shown in Figure 3, the peripheral lip **1** is thicker in cross-section than the center portion **2**. It is believed that the thicker

peripheral portion can add stability to the equilibrium positions. The center portion **2** can be of uniform thickness or it can taper such that the thickness of the center portion **2** nearest the peripheral lip **1** is thickest and becomes thinner as it approaches the peak **5**.

The dimensions of the device can vary depending upon both personal preference and the hand size of a user. Preferably, the disk has an overall diameter d (or length l of the longest dimension for non-circular shaped devices) ranging between about 0.75 inch and about 6 inches. The lip portion **1** forms a border around the center portion **2**. The lip is sized such that the ratio of the width w of the lip to the diameter d is a maximum of about 1/4. More preferably, w/d is in the range of about 1/30 to about 1/5. If the device is not circular, then the largest dimension of the device can be used as a pseudo diameter for considering the ratios discussed herein.

The thickness of the device depends upon a number of variables such as the diameter, the polymeric material being used to form the device including the flexibility of the material and its stiffness or hardness, the tactile response desired, etc. One skilled in the art can determine a suitable thickness by routine experimentation after fixing the other variables. Overall, the device has a substantially uniform cross-sectional thickness t, and the ratio of t/d typically is a maximum of about 1/10. More preferably, the ratio of t/d is in the range of about 1/80 to about 1/15. The thickness t_c of the center portion **2** for a one inch diameter disk made of ethylene-vinyl acetate preferably is about .05 to .08 inch. However, the thickness can taper from the periphery of the disk to the center where it can be thinner, as previously discussed. Preferably, the peripheral lip **2** thickness t_l is somewhat larger than the center portion **1** thickness t_c. The thickness of the peripheral lip portion is determined by appearance, tactile feeling and its affect on the stability of the equilibrium positions of the device. The thickness of the lip can be outside of the range of ratios discussed above, as long as the device exhibits the two equilibrium positions.

The height h_p of the peak(s) **5** above the peripheral lip **2** or the plane containing the peripheral edge of the device depends also upon such variables as the desired appearance, the diameter and thickness of the device, the desired tactile response, the material from which it is formed, the desired life, etc. Such height can readily be determined by a routine experimentation after fixing the other variables. As illustrated in Figures 2 and 3, the ratio of h_p/d preferably is a maximum of about 1/3. More preferably, the ratio of h_p/d ranges between about 1/5 and about 1/10.

In one preferred embodiment, the device is disk shaped made of ethylene-vinyl acetate copolymer and has an overall diameter of about 1.0 to 1.5 inches, a peripheral lip width of about 0.2 inch, a cross sectional thickness at the lip portion **1** t_l of about 0.030 inch, a cross sectional thickness at the center portion **2** t_c of about 0.013 to 0.018 inch, and a peak height h_p of about 0.12 to 0.18 inch. Even more preferably, the cross sectional thickness at the center portion **2** tapers from near the lip **1** inwards to the center such that the thickness near the lip **1** is about 0.030 inch and gradually decreases to a thickness t_c at the center of about 0.015 inch.

Other diameter disks preferably are formed having similar ratios of dimensions.

The device can be formed in the shape of a square, triangle, octagon and many other shapes. The dimensions of the device for such shapes are similar to a disk of approximately the same surface size. In such other shapes, the length "l" of the longest dimension is equivalent to the disk diameter d, and the thickness, peripheral lip width and height are dimensioned accordingly, as discussed above.

The entire device can formed from a sheet of a thin, flexible material. Thus, after forming the bi-stable device, an individual can invert the top and bottom surfaces **3**, **4** by manual manipulation. Preferably, the device is fabricated of a light, inexpensive polymeric material that is capable of

independently retaining its shape at each of the two equilibrium positions. Various materials can be used to provide diverse degrees of stiffness so that individuals have options in choosing the amount of pressure that must be applied to invert the device surfaces **3**, **4**. The surfaces **3**, **4** of the device also can be provided with various textures, such as smooth, ridged, bumpy, etc., each texture providing a different tactile affect when manually manipulated. The device may also be fabricated to emit sounds upon inverting the surfaces **3**, **4** between their convex and concave positions. Generally, such noise making is accomplished by choosing particular device materials that are stiffer to produce a popping or snapping sound when they are inverted. The devices also can be made in varying colors, including pearlescent or iridescent materials, or can incorporate glow in-the-dark materials. Logos, characitures, initials, photographs and other illustrations also can be painted or embossed on the device surfaces **3**, **4**. Scented compositions can be contained in the device material, so as to emit a scent when the device is manipulated. The material also can be heat sensitive, for example, so as to change color as it is manipulated.

The device can be fabricated from the flexible seal found within the cap of certain bottles, such as certain plastic soda bottles. If one opens certain soda bottles, at the interior surface of the cap can be found a disk seal that is a separate component from the cap. This disk seal is typically flat and disk-shaped, with a lip portion **1** and a center portion **2** (see FIG. 4). The lip portion **1** typically has a cross-sectional thickness greater than that of the center portion **2**, and the center portion **2** typically has a substantially uniform thickness as shown in FIG. 4. The exact dimensions of the seal will vary depending upon cap size and bottle type. This disk seal can be formed into a device in accord with the present invention having a bi-stable convex/concave shape by, for example, placing the center portion **2** over the tip of a hard curved surface of appropriate dimension, and pulling on the disk seal at the lip portion **1** until a peak **5** is formed at the center having the desired peak height h_p. When the device is formed as such, the center portion **2**, which was initially

uniform in thickness t, stretches out and becomes thinner and tapered in cross section from the lip portion **1** towards the peak(s) **5**.

The disk seals found in certain bottle caps are typically formed of a material known as "Compound E04", which is manufactured by Crown Cork and Seal. The material is flexible, resilient, tough and translucent. "Compound E04" is a polymer made of 18% vinyl acetate copolymer of polyethylene. The material has a tensile strength of 2700 psi, an elongation of 700% and a flexural modulus of 8000 psi.

Any polymeric material having similar properties can be used to manufacture the device beginning. Such materials must have physical characteristics that permit forming a central peak and must be capable of inverting between and retaining opposing concave and convex positions at the peak. When the device having peak(s) **5** are manufactured as described above, by placing a flat polymeric disk over a rounded surface member and exerting force to stretch the device, polymers that have a tensile strength of at least 800 psi, an elongation of at least 100% and a flexural modulus of at least 200 psi are preferred. The properties of the polymer are determined to prevent the device from breaking or splitting during the fabrication process and to provide a device having the bi-stable positions for use.

Some specific examples of polymers that are suitable for the purposes of this invention are those exhibiting the above described characteristics and are described in the MODERN PLASTICS ENCYCLOPEDIA HANDBOOK (published by McGraw-Hill, Inc., 1994), for example: fluoroplastics (such as polymers and copolymers of florinated ethylene and polypropylene); polyamides or nylons; polybutylenes; thermoplastic polyesters (such as polyethylene terephthalate "PET"); polyethylene and ethylene copolymers (such as ethylene-ethyl acrylate "EEA", ethylene-methacrylate "EMA", ethylene-vinyl acetate "EVA", ethylene butyl acrylate "EBA", ionomers, ethylene-vinyl alcohol copolymers "EVOH", and ethylene acid copolymers); silicones; thermoplastic elastomers (such as

polyolefin blends, thermoplastic copolyesters, and thermoplastic polyurethanes); vinyl polymers and copolymers; and blends thereof.

Alternatively, devices of the present invention can be formed from sheets of the polymer material by stamping the initial shape from a sheet to form a blank, and then forming the concave/convex portion by pulling the blank over a rounded surface. Another alternative is to form a plurality of concave/convex portions by vacuum forming the sheet, and then stamp out devices, each containing a concave/convex portion. Various textures can be formed onto the surface of the sheet by pressure and/or heated rollers or plates. Thus, the surfaces can be dimpled, contain ridges, or have other physical characteristics to provide a texture.

Another method for making the devices of the present invention uses molds for forming and shaping the device in one step by an injection molding process. Those skilled in the art easily may envision further alternative methods for making the devices of the present invention.

In addition to the use of colored polymeric materials, the surfaces **3, 4** can also be painted in varying colors, and logos, caricatures, initials, photographs and other illustrations can be painted or embossed on the surfaces **3**, **4**. The device can also incorporate chemicals to change colors with changes in temperature or other atmospheric conditions.

The invention including preferred embodiments thereof has been described herein. Such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the invention as set forth in the following claims.

I claim:

1. An amusement and stress relief device formed of a flexible, resilient polymeric material and comprising:

a center portion; and

a substantially planar peripheral portion surrounding the center portion;

the center portion having a concave/convex shape,

the device having two stable equilibrium positions wherein a first equilibrium position comprises a first surface having a concave shape and a second surface having a convex shape and a second equilibrium position comprises the second surface having a concave shape and the first surface having a convex shape,

whereby manual manipulation of the device inverts the first and second surfaces between the two stabile equilibrium positions.

2. The device of Claim 1 wherein the device is disk-shaped and has a diameter d in the range of about 0.75 inch to about 6 inches.

3. The device of Claim 2, wherein the peripheral portion comprises a lip having a width w wherein the ratio of w to d is not greater than about 1/4.

4. The device of Claim 3, wherein the ratio of w to d is in the range of about
1/30 to about 1/5.

5. The device of Claim 2, wherein the device has a substantially uniform cross-sectional thickness t over at least the center portion, and the ratio of t to d is not greater than about 1/10.

6. The device of Claim 5, wherein the ratio of t to d is in the range of about 1/80 to about 1/20.

7. The device of Claim 5, wherein the thickness t of the center portion is tapered, such that a thickness t_l near the peripheral portion is greater than a thickness t_c near the center.

8. The device of Claim 2, wherein a domed peak is formed in the center portion the peak having a height h_p relative to a plane containing the peripheral portion, and the ratio of h_p to d is not greater than about 1/3.

9. The device of Claim 1, wherein the polymeric material is an ethylene-vinyl acetate polymer.

10. The device of Claim 1, wherein at least one of the first and second surfaces are textured.

11. The device of Claim 10, wherein the texture is provided by ridges formed on the surface.

12. The device of Claim 10, wherein the texture is provided by dimples formed on the surface.

13. The device of Claim 1, wherein at least one surface comprises an illustration.

14. The device of Claim 1, wherein the material comprises a scent that is emitted from the device upon manual manipulation.

15. The device of Claim 1, wherein the material comprises a composition that changes the color of the device upon changes in temperature or changes in other environmental conditions.

16. The device of Claim 1, wherein the polymeric material is selected from the group consisting of fluoroplastics, polyamides, polybutylenes,

thermoplastic polyesters, polyethylene and ethylene copolymers, silicones, thermoplastic elastomers, vinyl polymers and copolymers, and blends thereof.

17. The device of Claim 1, wherein the material is a colored resin.

ABSTRACT OF THE DISCLOSURE

A device is described that possesses an overall shape that comfortably fits into a user's hand, and in particular, can be manipulated by the fingers. The device is fabricated of a pliable material that readily can be manipulated by manual pressure, yet holds its equilibrium positions absent pressure. The device has convex/concave surfaces which can be inverted to provide two stable equilibrium positions. The surfaces of the device may have different textures, such as smooth and ridged. The material of the device can have various colors, and also may be phosphorescent. Floral, fruit, spice and other scents may be added to the material such that the scent emanates from the device as the user manipulates the device.

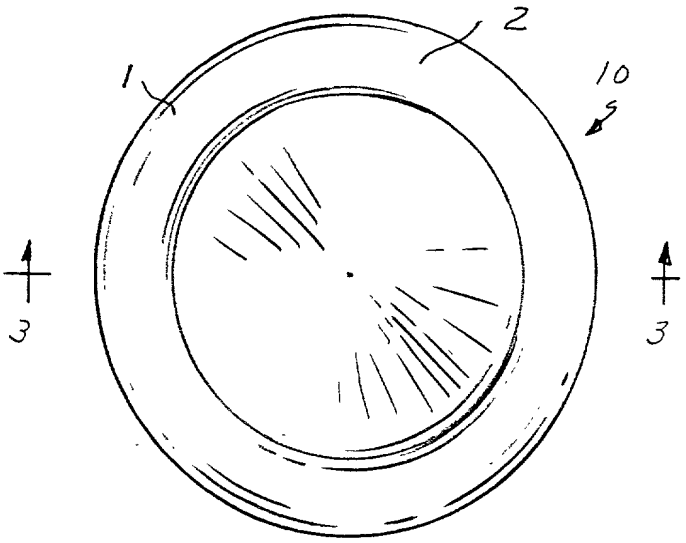

FIG. 1

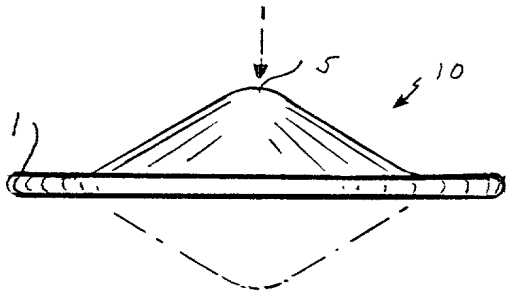

FIG. 2

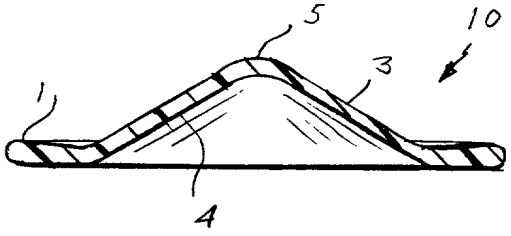

FIG. 3

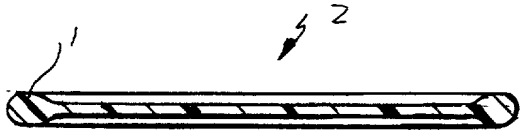

FIG. 4

DIKE, BRONSTEIN, ROBERTS & CUSHMAN, LLP
130 Water Street
Boston, Massachusetts 02109

Attorney's Docket No. 1923/48641

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed at 201) below or an original, first and joint inventor (if plural names are listed at 201-208 below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **ENTERTAINMENT AND STRESS RELIEF DISK**

which is described and claimed in:

☒ the specification attached hereto.

☐ the specification in U.S. Application Serial Number _____, filed on

☐ the specification in PCT international application Number _____, filed on _____; and was amended on _____.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign/PCT Applications and Any Priority Claims Under 35 U.S.C. §119:			
Application No.	**Filing Date**	**Country**	**Priority Claimed Under 35 U.S.C. §119?**
			☐YES ☐NO
			☐YES ☐NO
			☐YES ☐NO
			☐YES ☐NO
			☐YES ☐NO

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below, and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose material information as defined in 37 CFR §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

Prior U.S. Applications or PCT International Applications Designating the U.S-Benefit Under 35 U.S.C. §120				
U.S. Applications		Status (Check One)		
Application Serial No.	U.S. Filing Date	Patented	Pending	Abandoned
PCT Applications Designating the U.S.				
Application No.	Filing Date	U.S. Serial No. Assigned		

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S) (35 U.S.C. §119(e))

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

Applicant	Provisional Application Number	Filing Date

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) with full powers of association, substitution and revocation to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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